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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/034,696	12/27/2001	Ioannis Pavlidis	H0002442-01	1502

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EXAMINER

LAVIN, CHRISTOPHER L

ART UNIT PAPER NUMBER

2621

DATE MAILED: 07/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/034,696

Applicant(s)

PAVLIDIS, IOANNIS

Examiner

Christopher L. Lavin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 28 April 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 - 43 is/are pending in the application.
- 4a) Of the above claim(s) 3, 7, 11, 14, 18, 22, 25 and 32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1 - 43 is/are rejected.
- 7) ☐ Claim(s) 2 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 May 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. The following quotations of 37 CFR § 1.75(a) is the basis of objection

(a) The specification must conclude with a claim particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention or discovery.

Claim 2 is objected to under 37 CFR § 1.75(a) as failing to particularly point out and distinctly claim the subject matter which the applicant regards as his invention or discovery. In claim 2 the applicant states "physically marking the defined search area". The phrase could be construed to me that someone actually goes out and in some fashion marks off the entire search area. The spec reads (paragraph 99 of the detailed disclosure): "The points in the overlapping portions are projections of physical ground plane points that fall in the overlapping portion between the fields of view of the two imaging devices for which a matrix is being computed. These points are selected and physically marked on the ground during installation of the imaging devices 30. Thereafter, the corresponding projected image points can be sampled through a graphical user interface by a user so that they can be used in computing the transformation matrix." Based on the spec the examiner will interpret claim 2 to mean that landmarks use to compute homography are marked in some fashion and not the entire search area.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1, 2, 4 – 6, 8 – 10, 12 – 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uyttendaele (6,701,030) in view of Kanatani ("Optimal Homography Computation with a Reliability Measure", IAPR Workshop on Machine Vision Applications, Nov. 17 – 19, 1998) and Hansen (6,081,606).

In regards to claim 1, Uyttendaele's search area is the panoramic image. In regards to the outer perimeter edge, when Uyttendaele creates the panoramic image there is an upper and lower perimeter edge (as a panoramic image can be considered a ring, which has two edges) either could be the outer perimeter edge. Uyttendaele discloses in figure 3A a method for combining a plurality of frames of image pixel data. In step 300 Uyttendaele acquires multiple frames of image pixel data. In the paragraph starting at column 4, line 45 Uyttendaele discloses, "a camera 163 capable of capturing a sequence of images 164 can also be included as an input device to a personal computer." Any image inputted into a computer must be comprised of pixels. Uyttendaele then discloses in the paragraph starting at column 5, line 50 that each frame is "captured by a different cameras from a different viewpoint." Uyttendaele discloses in the paragraph starting at column 7, line 41 that "the lateral field of view of each camera overlaps by at least 20 percent." This is about 25 percent. Returning to figure 3A Uyttendaele discloses in step 306 that the image frames are combined (mosaic). Uyttendaele discloses in step 308 compensating for any localized ghosting. Uyttendaele however, does not disclose the use of a homography transformation matrix to perform this "deghosting" or warping of the images.

Kanatani teaches in the Introduction on page 426 that, "A homography is a mapping that occurs between two perspective images of a planar surface in the scene. The computation of homographies plays an essential role in image registration and mosaicing."

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to use homography transformation matrices (as taught by Kanatani) to assist in the "deghosting" and warping performed in the mosaicing of Uyttendaele. Homography allows for the mapping between two points which would be necessary for the merging of images performed by Uyttendaele, this could result in a cleaner mosaicing with less ghosting.

Uyttendaele (as modified by) Kanatani discloses a method for obtaining a mosaiced video. Uyttendaele however, does not disclose the use of this method for surveillance.

Hansen teaches in the paragraph starting in column 1, line 46 that a video image can be used to track a moving object.

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to track a moving object (as taught by Hansen) in the video created by Uyttendaele in view of Kanatani. The mosaiced video created by Uyttendaele in view of Kanatani would be ideal for surveillance as a mosaiced image can cover much more of a search area in high resolution than a single camera can. Allowing for more accurate tracking and detection of abnormal situations.

In regards to claim 2, Kanatani discloses the use of homography matrices, which are based on landmark points of commonality as seen in the first full paragraph in the second column on page 426. A landmark by its very definition is a physical mark.

In regards to claims 4 – 6, 8 – 10, 12, 15 – 17, 19, 21, 23, 26 – 30, 33 – 37, and 39 – 43, these claims are rejected for the same reasons provided in the prior office action.

In regards to claim 13, claim 13 is rejected for the same reasons as claim 1. The argument analogous to that presented above for claim 1 is applicable to claim 13.

In regards to claim 20, The system of claim 13, wherein the plurality of imaging devices comprise: a first imaging device positioned at a first installation site such that a field of view for the first imaging device covers at least a region of the defined search area along at least a portion of the outer perimeter edge thereof (col. 7, lines 12 – 14: Assume there are six cameras, numbered 1 through 6. Camera one covers this operation of the claim, as it covers part of the search area along a portion of the outer perimeter.); one or more additional imaging devices positioned at the first installation site to cover with fields of view thereof one or more regions of the defined search not covered by the field of view of the first imaging device (Camera 2 covers this part of the claim); and one or more additional imaging devices positioned at one or more additional installation sites to cover with fields of view thereof one or more additional regions of the defined search area not covered by the fields of view of the imaging devices positioned at the first installation site, wherein the fields of view of the positioned imaging devices

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provide for coverage of the entire search area (Cameras 3 – 6 can cover the final part of this as additional installation sites is not defined to be in a physically different location.).

In regards to claim 24, A method for use in monitoring a search area, wherein the method comprises: defining a search area having an outer perimeter edge (The search area is the panoramic image. In regards to the outer perimeter edge, when Uyttendaele creates the panoramic image there is an upper and lower perimeter edge (as a panoramic image can be considered a ring, which has two edges) either could be the outer perimeter edge.); positioning a first imaging device at a first installation site such that a field of view for the first imaging device covers at least a region of the defined search area along at least a portion of the outer perimeter edge thereof (col. 7, lines 12 – 14: Assume there are six cameras, numbered 1 through 6. Camera one covers this operation of the claim, as it covers part of the search area along a portion of the outer perimeter.); positioning one or more additional imaging devices at the first installation site to cover with fields of view thereof one or more additional regions of the defined search area not covered by the field of view of the first imaging device (Camera 2 covers this part of the claim); and positioning one or more additional imaging devices at one or more additional installation sites to cover with fields of view thereof one or more additional regions of the defined search area not covered by fields of view of the imaging devices positioned at the first installation site, wherein each field of view of each imaging device comprises a field of view portion which overlaps with at least one other field of view of another imaging device, wherein the field of view portion which overlaps is greater than about 25 percent of the field of view of the imaging device

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wherein the fields of view of the positioned imaging devices provide for coverage of the entire search area (Cameras 3 – 6 can cover the final part of this as additional installation sites is not defined to be in a physically different location. Uyttendaele discloses in the paragraph starting at column 7, line 41 that “the lateral field of view of each camera overlaps by at least 20 percent.” This is about 25 percent.).

In regards to claim 31, claim 31 is rejected for the same reasons as claim 24. The argument analogous to that presented above for claim 24 is applicable to claim 31.

In regards to claim 38, claim 38 is rejected for the same reasons as claim 1. The argument analogous to that presented above for claim 1 is applicable to claim 38.

Response to Arguments

4. Applicant's arguments filed 04/28/05 have been fully considered but they are not persuasive.

The applicant's primary argument focuses on whether the outer perimeter defined by Uyttendaele can be used to reject the perimeter claimed.

As shown in the action the panoramic image, i.e., the search area, is defined by two outer perimeters. In order for the six cameras (col. 7, lines 12 – 14 of Uyttendaele) to be placed correctly their positioning has to be defined by these outer perimeters or else the panoramic image will not look complete as some sections will end at higher locations than others.

The second argument is that 20 percent is not 25 percent.

It should be noted that the claims read “about 25 percent” and not 25 percent. Therefore the examiner is free to interpret about 25 to include 20.

Finally the applicant argues that there is no teaching that motion tracking would be usable in an image generated based from multiple sites.

The panoramic image that is created can for the purposes of image processing be considered a single image. Thus Hansen shows that motion tracking is usable in an image.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher L. Lavin whose telephone number is 571-272-7392. The examiner can normally be reached on M - F (8:30 - 5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mancuso Joseph can be reached on (571) 272-7695. The fax phone

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number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Christopher Lavin



BRIAN WERNER
PRIMARY EXAMINER